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| 24124 7590 04/23/2008<br>BOHAN, MATHERS & ASSOCIATES, LLC<br>PO BOX 17707<br>PORTLAND, ME 04112-8707 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| CHORBAJ, MONZER R  |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/663,106

**Applicant(s)**

CLINE, AMOS E.

**Examiner**

MONZER R. CHORBAJI

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2007.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/5508)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

### DETAILED ACTION

**This final action is in response to the amendment received on 06/26/2007**

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The disclosure as a whole does not teach that shear forces and compression forces are exerted on a total volume of the process fluid and also does not teach exposing the total volume of the process fluid to acoustic energy.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaffney (U.S.P.N. 3,278,165).

Regarding claim 1, Gaffney discloses an acoustic generating device (figure 19: 90, 91, and 93) comprising: a housing (figure 19:90) having an inner diameter (unlabeled inner diameter of housing 90 in figure 19), a first housing end (unlabeled right hand side end of housing 90 in figure 19) with an inlet (unlabeled inlet on the right hand side end of housing 90 figure 19), a second housing end (unlabeled wall with an orifice on the left hand side of figure 19) with an outlet orifice (figure 19:91), a longitudinal axis that extends from the first housing end to the second housing end (imaginary straight line in the middle of housing 90 that extends from first housing end to second housing end), and an expanded flow area (unlabeled area where the plurality of vibratory means are located as shown in figure 19) extending between the inlet (unlabeled inlet on the right hand side end of housing 90 figure 19) and the outlet orifice (figure 19:91), wherein a process liquid is flowable through the expanded flow area; and two oscillatory members (figure 19:92) assembled within the expanded flow area (unlabeled area where the plurality of vibratory means are located as shown in figure 19) and spaced a distance apart from one another (unlabeled space distance between vibratory elements 92 in figure 19); and a flow of the process

fluid through the inlet orifice into the expanded flow area results in turbulent flow (col.4, lines 24-29); wherein the turbulent flow of the process liquid causes the oscillatory members to vibrate (col.4, lines 28-30), thereby converting a flow energy of the process liquid to an acoustic energy that works on the process liquid (col.4, lines 39—40, vibrations created by acoustic energy do work by defibering of fibrous material in the fluid). As to the limitations that the vibration of the oscillatory members transmits the acoustic energy and the flow energy back and forth between the oscillatory members, thereby increasing the turbulent flow that is initially generated at the inlet orifice and causing alternating expansion and contraction in the distance between the oscillatory members; wherein said alternating expansion and contraction in the distance between the oscillatory members increases shear forces and compression forces exerted on the process liquid, acoustic energy created by plurality of spaced vibratory members (figure 19) in combination with the multiple orifices and the force associated with the turbulent fluid flowing within the apparatus, Gaffney's apparatus is capable of generating shear forces and compression forces that are exerting work on the passing fluid. As to the limitations that shear forces and compression forces are exerted on a total volume of the process liquid, one of ordinary skill in the art would recognize that Gaffney realizes the need to treat the entire volume of fluid passing through the apparatus with acoustic energy by providing a plurality of orifices in combination with plurality of vibratory elements (figure 18) so that all of the passing fluid is subjected to shear and compression forces. Furthermore, as to the limitation that the first housing end has an inlet orifice (figure 1:2), Gaffney

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discloses in another embodiment in figure 18 where the first housing end has an inlet orifice 91 and an outlet orifice 91 as well. As such it would have been obvious to one of ordinary skill in the art at the time of the invention to provide an inlet orifice in the embodiment shown in figure 19 since the combination of vibratory element with an orifice generates acoustic vibrations in flowing fluid (col.7, lines 47-49).

Regarding claim 14, Gaffney discloses a method for effecting sonochemical processes (col.4, lines 39-50) in a process fluid (for example, organic material-containing waste effluent as described in col.4, lines 49-50), the method comprising the steps of: providing a plurality of oscillatory members (figure 18: 92 and col.8, lines 31-34) that are spaced a distance apart (see unlabeled distance between oscillatory members 92 in figure 18) and are prone to vibration; creating turbulent flow on a process fluid (col.8, line 32 and col.4, lines 23-28); forcing the turbulently flowing process fluid to flow past the oscillatory members (see the arrow in figure 18 for indicating the direction of the flowing fluid and oscillatory members 92), the turbulently flowing process fluid causing the oscillatory means to vibrate (col.4, lines 25-29), thereby producing acoustic energy (col.4, lines 30-33), and using the acoustic energy to do work on the process fluid (col.4, lines 39—40, vibrations created by acoustic energy do work by defibering of fibrous material in the fluid). As to the limitations that the acoustic energy is passed back and forth between the oscillatory members, thereby increasing the turbulent flow and causing alternating expansion and contraction in the distance between the oscillatory members and increasing the shear forces

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and the compression forces working in the process liquid, their subject matter (MPEP 2112, II) is inherent in the teachings of the Gaffney reference. Further, as to the limitations of forcing the process fluid and the acoustic energy through a flow path that exposes a total volume of the process fluid to the acoustic energy, one of ordinary skill in the art would recognize that Gaffney realizes the need to treat the entire volume of fluid passing through the apparatus with acoustic energy by providing a plurality of orifices in combination with plurality of vibratory elements (figure 18) so that all of the passing fluid is treated.

Regarding claims 12-13, Gaffney is capable of sanitizing process liquids and also homogenizes various process fluids (col.4, line 43).

**6.** Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gaffney (U.S.P.N. 3,278,165) as applied to claim 1 and further in view of Grange et al (U.S.P.N. 4,129,387).

Gaffney fails to teach that the acoustic generator comprises a seal cap, an o-ring, and a nipple insert. Grange discloses the following: a housing seal assembly (figure 1:2, 5 and 24) that includes a seal cap (figure 1:5), an o-ring (figure 1:24), a nipple insert (unlabeled outer end of 2 in figure 2), housing seal assembly fitting over the first end of the housing (in figure 1, 2 and 5 fits over the first unlabeled end of housing 1), and a nipple insert (unlabeled outer end of 2 in figure 2) that provides a flow path into the inlet in order to provide an apparatus which is easy to adjust in use to suit varying conditions and changes in liquids being passed through the device (col.1, lines 45-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the device

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in Gaffney with claimed structures in order to provide an apparatus which is easy to adjust in use to suit varying conditions and changes in liquids being passed through the device as explained by Grange (col.1, lines 45-47).

7. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaffney (U.S.P.N. 3,278,165) as applied to claim 1 and further in view of Hemker (U.S.P.N. 3,856,270).

Regarding claims 2-5, Gaffney fails to teach placing a plurality of resonating perforated baffles within the housing. Hemker discloses the following: placing plurality of vertically aligned perforated baffles within a housing (figure 1:11, 15, 37 and 49) where each baffle has a face (figure 3:43) with a through-hole (figure 3:47) and an outer perimeter of the face corresponds with the inner diameter of the housing (see plate 43 sealing touches the inner surfaces of housing 11 in figure 1). Each baffle has a flow-control aperture (figure 2:15, 33) with a small diameter. Each baffle includes two of the flow-control apertures (figure 2:15, 33 and 29) and a spacer (figure 1:15), the diameter of through-hole of spacer (figure 2:15 and 19) is larger than the small diameter of the flow-control aperture (figure 2:15 and 33). Flow-control baffles are separated from one another by a spacer (figure 1:37). Flow-control baffle (for example, 37 in figure 3) includes a single-aperture baffle (figure 4:53) and a multiple-aperture flow control baffle (figure 3:37, 47 and 39). Single-aperture baffle has a single flow-control aperture (figure 4:53) and multiple-aperture baffle has multiple flow-control apertures (figure 3:37, 47 and 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to further place Hemker's

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vertically oriented perforated baffle plates within Gaffney's housing so that an intimate blending of all portions of the liquid is additionally accomplished as explained by Hemker (col.2, lines 61-64).

8. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaffney (U.S.P.N. 3,278,165) as applied to claim 1 and further in view of Branson (U.S.P.N. 3,222,221).

Regarding claims 7-11, Gaffney fails to teach the following: the oscillatory means include an oscillatory circuit, a pair of piezoelectric members that includes first and second members that are electrically connected with the oscillatory circuit, the use of flow partition between the piezoelectric members and extending in a direction parallel to the longitudinal axis and the piezoelectric members connected to a pulse generator. Branson ultrasonically cleans items within a liquid and teaches the following: an inherent oscillatory circuit for the acoustic device to operate, a pair of first and second piezoelectric members (figure 1:22) that are necessarily connected to the oscillatory circuit so that sonic energy is generated, the acoustic waves emanating from the piezoelectric members (figure 2:22 and imaginary longitudinal axis from one end of the tank to the other) inherently travel in a direction transverse to the longitudinal axis of the tank, flow partition disposed between the piezoelectric members (figure 2:15, 17 and 22) and is capable of extending in a direction parallel to the longitudinal axis of the tank, the first piezoelectric member is necessarily connected to the oscillatory circuit for the acoustic device to operate, a pulse generator (col.3, lines 71-72) and the use of multiple pairs of piezoelectric members (figure 2:22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to place Branson's piezoelectric members into Gaffney's housing so that fluids with different densities are treated ultrasonically as explained by Branson (col.5, lines 24-29).

### ***Response to Arguments***

9. Applicant's arguments filed on 06/26/2007 have been fully considered but they are not persuasive.

Applicants arguments presented on pages 8-12 of the Remarks/Arguments section with regard to the Grange et al. reference are moot based on the presented new grounds of rejection due to amended independent claims 1 and 14.

On pages 12-14 of the Remarks/Arguments section, Applicant argues that Hemker does not teach a plurality of oscillating members. Hemker is combined with Gaffney for the structure recited in claims 2-5 and not for whether the baffles oscillate or not. The combination of Gaffney and Hemker would provide oscillating plurality of baffles having apertures within them.

On pages 14-16 of the Remarks/Arguments section, Applicant argues that Branson does not teach that water flow along the axis of the housing; and that the waves emanating from the elements do not travel in a direction transverse to the longitudinal axis of the bath. Branson is combined with Gaffney for the use of piezoelectric devices where the flow of the acoustic energy is an inherent part of the devices.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571)272-1271. The examiner can normally be reached on M-F 9:00-5:30.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

**14.** Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. C./

/Jill Warden/  
Supervisory Patent Examiner, Art Unit 1797